SUPERCONDUCTING MAGNETIC ENERGY STORAGE (SMES-ETM) SYSTEM

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS IMPLEMENTATION PLAN

(DELIVERABLE 4.2)

28 November 1989

DMSS/Berger

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Preface

The Defense Nuclear Agency (DNA) is initiating an environmental investigation for the construction and operation of a Superconducting Magnetic Energy Storage Engineering Test Model (SMES-ETM). The Strategic Defense Initiative Organization (SDIO) is participating as a cooperating agency. This Environmental Impact Assessment Process (EIAP) Implementation Plan serves as the overall framework within which the SMES-ETM EIAP will occur. As the second deliverable of thirteen reports and briefings under this Task Order, the Plan focuses on two primary points. The first is the integration of all reports, briefings, and associated work efforts into a comprehensive environmental process that satisfies the requirements of the National Environmental Policy Act (NEPA). The second is the identification and methodology for implementation of the technical efforts associated with the SMES-ETM EIAP.

Five series of work activities form the core of the SMES-ETM Environmental Impact Assessment Process and thus the EIAP Implementation Plan itself. These activities result in five major documents and reviews. The first is the review of Governmental Furnished Information (GFI). This activity provides for the compilation of all available information so as to determine the adequacy of existing data and additional data requirements. The second activity is the preparation of the Description of the Proposed Action and Alternatives (DOPAA). The DOPAA forms the common technical description of the SMES-ETM upon which the environmental analysis is conducted. The third activity is the preparation of an Environmental Issues Summary. All environmental issues are reviewed in order to determine which of these are potentially significant. This would include technology, non-site specific, and site specific issues. These issues lead to the fourth major activity; the Technical Analysis Report and Briefing. The purpose of this fourth activity is to review all work performed to that point in order to provide recommended courses of action and to assist in the determination of the appropriate level of environmental documentation. The fifth activity is the preparation of the environmental documentation for the SMES-ETM Program that fully meets NEPA requirements and other appropriate regulations such as DoD 6050.1 and DNA 6050.1.

The following table illustrates the series of reports and briefings required under Task 4, submittal dates of completed tasks, and scheduled submittal dates from Notice to Proceed (NTP) for remaining tasks. The Environmental Impact Assessment Process Implementation Plan (Deliverable 4.2) is presented below in relation to the other SMES-ETM deliverables.

SCHEDULE FOR TASK FOUR DELIVERABLES
NOTICE TO PROCEED 14 AUGUST 1989

DELIVERABLE	TITLE	STATUS
4.1	BRIEFING: TASK SUMMARY	COMPLETED 30 AUGUST 89
4.2	REPORT: DRAFT EIAP IMPLEMENTATION PLAN	COMPLETED 28 September 89
	REPORT: FINAL EIAP IMPLEMENTATION PLAN	**COMPLETED 28 November 89**
4.3	REPORT: DRAFT DOPAA	COMPLETED 11 OCTOBER 89
4.4	REPORT: FINAL DOPAA	IN PROGRESS COMPLETION: 28 November 89
4.5	REPORT: FINAL ENVIRONMENTAL ISSUES SUMMARY	COMPLETED 28 NOVEMBER 89
	REPORT: TECHNICAL WHITE PAPER; Electromagnetic Effects	COMPLETED 28 November 89
4.6	REPORT: TECHNICAL ANALYSIS	IN PROGRESS COMPLETED 28 NOVEMBER 89
4.7	BRIEFING: TECHNICAL ANALYSIS	IN PROGRESS COMPLETION: 1 DECEMBER 89
4.8	REPORT: PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT	165 DAYS FROM NTP
4.9	RESPOND TO COMMENTS PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT	190 DAYS FROM NTP
4.10	REPORT: DRAFT ENVIRONMENTAL ASSESSMENT	205 DAYS FROM NTP
4.11	REPORT: DRAFT FINDING OF NO SIGNIFICANT IMPACT	205 DAYS FROM NTP
4.12	REPORT: DRAFT ENVIRONMENTAL ASSESSMENT MEETING	210 DAYS FROM NTP
4.13	REPORT: FINAL ENVIRONMENTAL ASSESSMENT	240 DAYS FROM NTP

SUPERCONDUCTING MAGNETIC ENERGY STORAGE (SMES-ETM)

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS IMPLEMENTATION PLAN

1.0 Introduction and Purpose

This Environmental Impact Assessment Process Implementation Plan provides the framework within which an environmental assessment (EA) will be prepared for the SMES-ETM Program. Should a determination be made at a later date that an environmental impact statement (EIS) will be necessary, this EIAP Implementation Plan will also serve as the framework for that effort. This framework provides a means of managing and documenting the SMES-ETM environmental process so as to be consistent with all provisions in DoD 6050.1 and DNA 6050.1.

The purpose for developing this framework is to serve as an overall guide for managing the SMES-ETM Environmental Impact Assessment Process. The goals toward which the EIAP are directed are five-fold. First, the Implementation Plan is to allow DNA and SDIO to maintain the overall SMES-ETM program schedule by ensuring timely completion of the interrelated tasks in the environmental impact assessment process. Second, the Implementation Plan is to create an understanding of the process for those managing the effort in order to accomplish the EIAP in an efficient and cost effective means as possible. The third goal of the Implementation Plan is to function as a monitoring tool so that the managers know where they are in the EIAP of a given time and to ensure that the resources being committed are done so efficiently. The fourth goal is to ensure that all managers in the process have a clear and articulate understanding of their respective roles and responsibilities for which they will be held accountable. The fifth and final goal is to ensure that prior to analysis being conducted on the proposed SMES-ETM Program, all analysts and managers have a common understanding of the total known scope of which the appropriate environmental documentation is being prepared.

The Implementation Plan is structured so as to accomplish these goals. Chapter 2.0 presents the scope of this EIAP for the SMES-ETM Program. It will provide the constraints and general guidelines for the environmental analysis. Chapter 3.0 defines the roles of management and corresponding responsibility between DMSS, LBII, SPARTA, and SDIO. Chapter 4.0 is a description of the impact analysis process including determination of level of impact, significance, and impact analysis procedures. Chapter 5.0 describes the eight resource areas that will comprise the heart of the EIAP. These resource areas are: 1) Biological Resources, 2) Geology/Water Resources, 3) Air/Noise Resources, 4) Socioeconomic Resources, 5) Utilities/Energy Resources, 6) Transportation, 7) Hazardous Wastes, and 8) Cultural Resources. Chapter 6.0 identifies the scoping, contact, and clearance process that will be conducted during the preparation of all environmental documentation. Chapter 7.0 presents the outline to be used in the preparation of either an EA or an EIS.

2.0 Scope of the EIAP Effort

The Defense Nuclear Agency (DNA) Site Narrowing Report has narrowed siting alternatives to five candidate sites.

The environmental analysis will be conducted on the five candidate site alternatives for the SMES-ETM system. These five sites are:

- White Sands Missile Range (WSMR) Site, New Mexico
- Badger Army Ammunition Plant (BAAP) Site, Wisconsin
- BPA Hanford Reservation Site, Washington
- Orogrande Site, New Mexico
- TU Electric Monahans Site, Texas

This Implementation Plan will lead to the production of appropriate environmental documentation that will meet CEQ and NEPA requirements and will support decisionmaking on the siting and construction of the SMES-ETM.

The environmental documentation associated with the SMES-ETM will analyze the effects of constructing and operating the system at each of the candidate sites.

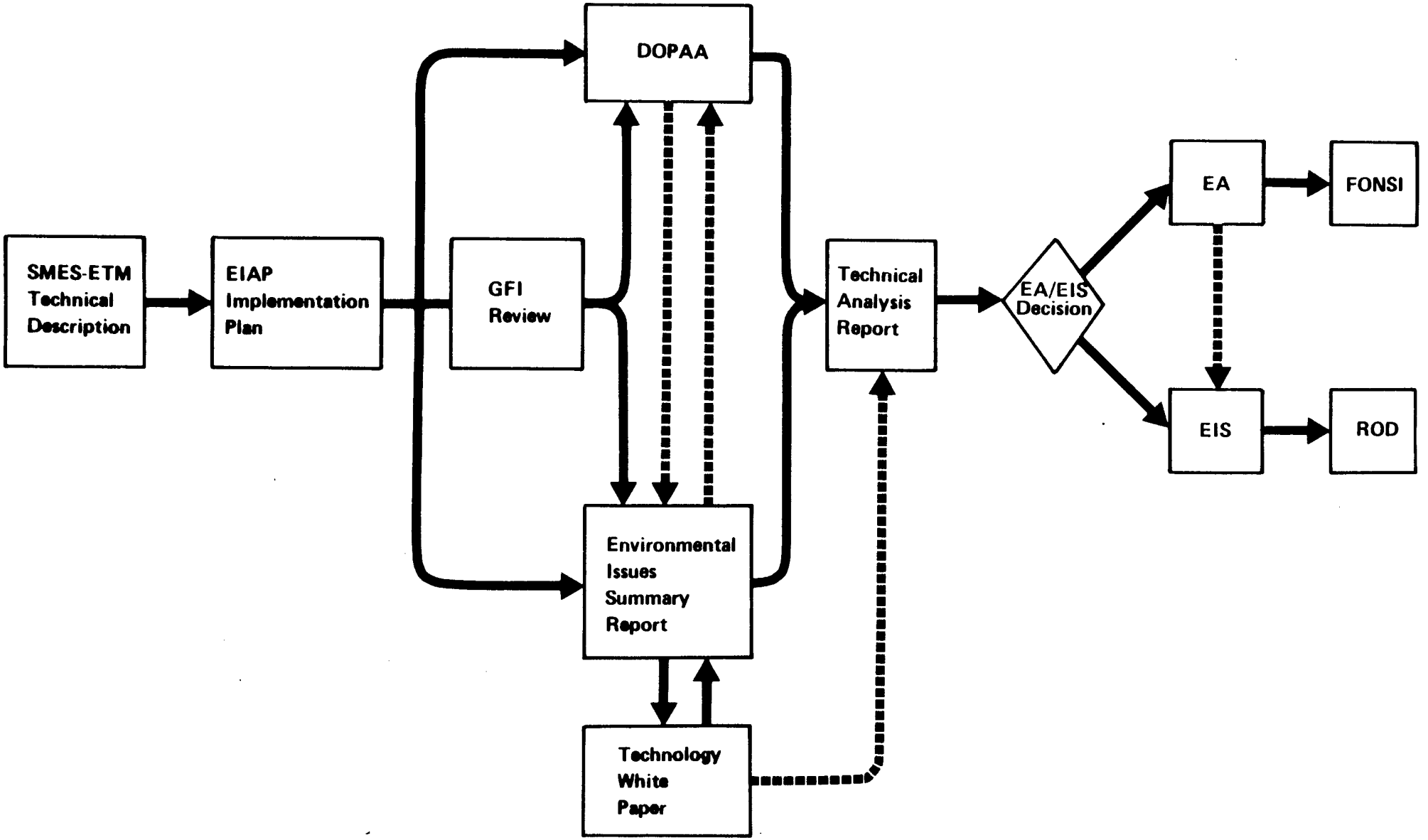
Preparation of the environmental documentation occurs within the context of the EIAP. This includes those documents that serve as building blocks toward the final product. Figure 2.1 presents the documentation process for the SMES-ETM EIAP.

This implementation plan recognizes the constraints and general direction under which either an EA or an EIS will be prepared. These are as follows:

- All data collection and analysis will be conducted at an EIS level through Fall 1989.
- A decision as to whether an EA or EIS will be issued will be made by SDIO on or about 1 December 1989. This decision will be made with input from the Environmental Summary Report. The Summary Report will identify key issues that are potentially significant as determined by NEPA criteria and which will influence which level of documentation is most appropriate for satisfying NEPA requirements. Two other deliverables will influence the EA/EIS decision. These are the Technical Analysis Report (Deliverable 4.6) and the Technical Analysis Briefing (Deliverable 4.7). These two deliverables will review the EIAP, discuss the potentially significant environmental issues identified in the Environmental Issues Summary Report, present options available to DNA and SDIO, and make recommendations of possible courses of action.

Figure 2.1

SMES-ETM EIAP DOCUMENTATION PROCESS



- If an EA is elected, the PDEA will be due on 26 January 1990, the DEA will be done on 7 March 1990, and the Final EA will be due on 11 April 1990.

- If an EIS is elected, the PDEIS will be due on 11 April 1990, the DEIS will be due on 9 May 1990, the FEIS will be due on 31 August 1990 and the Record of Decision (ROD) published on 10 October 1990.

- A Description of the Proposed Action and Alternatives (DOPAA) will describe the SMES-ETM system, system components, and specific estimates of construction and operation requirements. Significant revisions to the DOPAA after 27 November 1989 may result in schedule revisions.

- The EIAP will lead to the production of an EA of no more than 150 pages or an EIS of no more than 300 pages, including maps, figures, and tables.

- In addition to the National Environmental Policy Act, DoD 6050.1 and DNA 6050.1, there is a need to comply with other federal statutes and regulations. Compliance will also be required with state water and environmental laws for those states having jurisdiction over the five candidate sites.

- The proposed schedule for an EA is found in Table 2.1.

- The proposed schedule for an EIS is found in Table 2.2.

3.0 Management Roles and Responsibilities

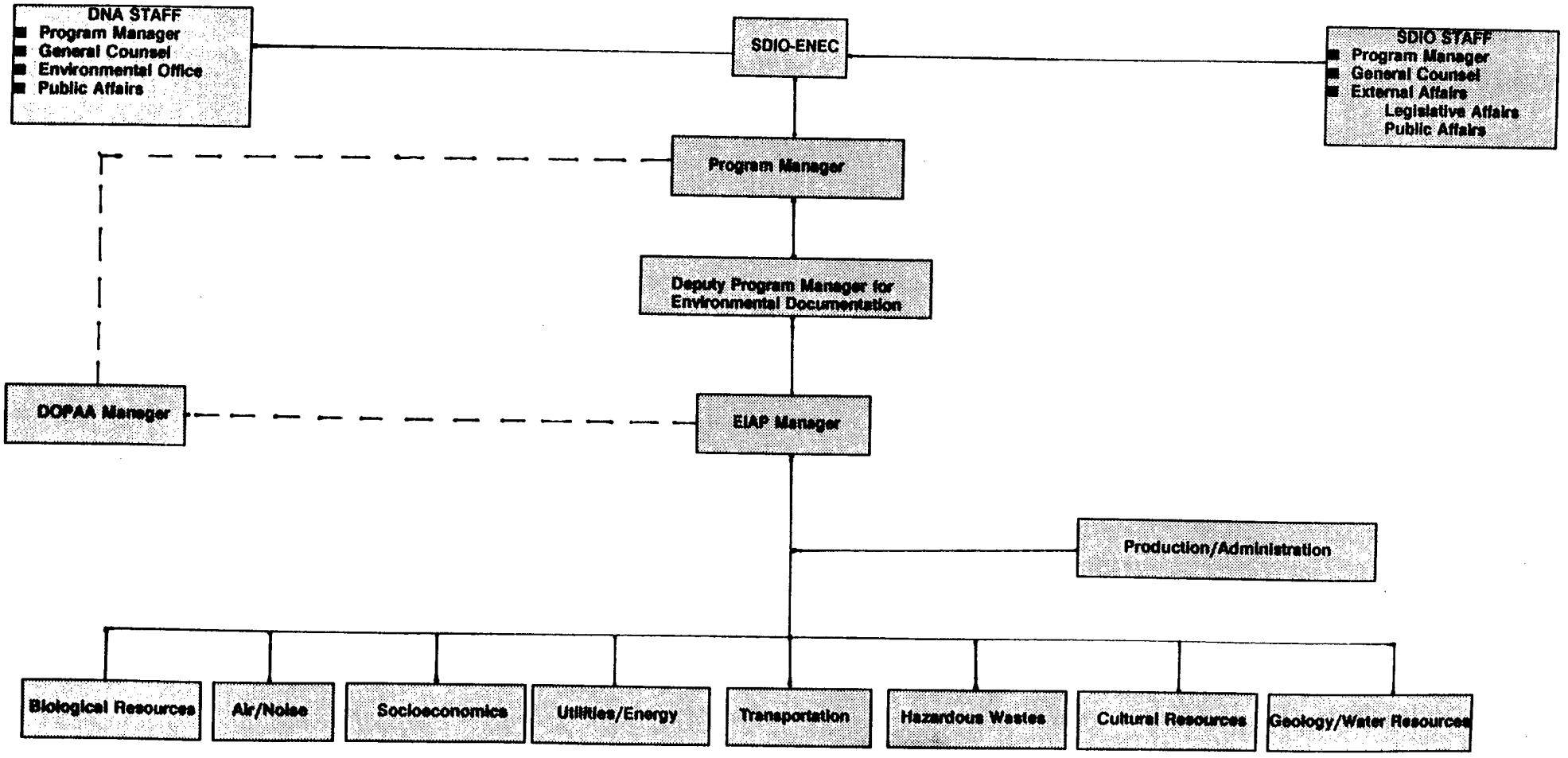
The Defense Nuclear Agency is the lead agency for the SMES-ETM EIAP. The Strategic Defense Initiative Organization is serving as cooperating agency. DNA has requested that SDIO assume responsibility for the development of information, and preparation of environmental analysis, in accordance with 40 CFR 1501.6, for support of the SMES-ETM Program. SDIO is utilizing the services of its environmental coordinator, DMSS/Berger/Sparta, to comply with this request.

SDIO will coordinate all SMES-ETM related environmental activities. All Task 4 deliverables will be submitted to SDIO which in turn will distribute appropriate review copies to DNA, SDIO Program Manager, General Counsel, and other organizations as appropriate. General Council will serve in a review capacity to advise SDIO and DNA on the SMES-ETM's compliance with NEPA, DoD 6050.1 and DNA 6050.1.

The DMSS/Berger team is responsible to SDIO for the timely, within budget performance of directed assignments in preparation of all Task 4 deliverables. The DMSS Program Manager receives program and policy direction from SDIO. These directions are communicated to the project team through an established chain of command (Figure 3.1).

FIGURE 3.1

SMES-ETM EIAP ORGANIZATION CHART



The EIAP Manager is responsible for the overall effort of preparing SMES-ETM related environmental documentation in full accord with SDIO policy. He receives specific policy and project requirements from the Program Manager and interpretation of these from the Deputy Program Manager for Environmental Documentation. The technical work is accomplished by the Senior Resource Analysts for each resource area, and their technical staff.

Directives and advice are received from SDIO.

Document control is recognized as an important function in the overall management system. To that end, all memorandums developed in conjunction with the SMES-ETM EIAP are entered, in the order that they are received, into a log book by the project Administrative Assistant (AA). In addition, all team members must keep a record of telephone and meeting contacts which also is logged by the project AA. Prior to field visits, a contact clearance request is made to SDIO with the record of authorization also logged.

4.0 Impact Analysis Process

For purposes of this project, a two-step procedure to quantify and assess environmental impacts within each resource area's Region of Influence (ROI) has been established. The first step is the determination of level of impact (LOI) with the ROI according to predetermined criteria. The second step is the determination of significance (i.e., significant or not significant) of the impact, again according to predetermined criteria. The following methodology will be used to determine criteria for LOI and significance, as well as determining the impact analysis procedures.

4.1 Regions of Influence

A written description of the Region of Influence (ROI) will be provided and identified on a map for each environmental resource. The ROI will include all potential direct and indirect impacts from the proposed project. Direct impacts are those which are directly attributable to the project itself. Indirect impacts result from the induced population locating in a community related directly or indirectly to the SMES-ETM project.

ROI's by resource will be provided for all alternative sites. Beyond the project construction sites, the basis for determining most ROI's for the Human Environment Resource Areas will be socioeconomic forecasts of direct and indirect population increases due to the SMES-ETM project. The initial ROI will be that area in which a population increase will be experienced. The actual resource ROI boundary will be obtained by overlaying the resources traditional boundary over that identified by socioeconomic forecasts. For example, the water resource ROI would be bounded by water basin boundaries; and the water supply ROI would be bounded by water district boundaries; and the electric supply ROI would be bounded by power utility boundaries.

TABLE 2.1

PROPOSED SCHEDULE FOR AN ENVIRONMENTAL ASSESSMENT

Activity	Completion Date
Notice to Proceed	14 August 1989
Internal Scoping and Review of GFI	30 August 1989
Data Collection	10 November 1989
Environmental Issues Determination	20 November 1989
Analysis of Data	2 February 1990
Preliminary Draft EA	26 February 1990
DNA/SDIO-ENEC Review	5 March 1990
Draft EA	26 March 1990
DNA/SDIO-ENEC Review	9 April 1990
Final EA	23 April 1990
DNA/SDIO-ENEC Review	30 April 1990
Policy and Security Review	7 May 1990
Final EA Published	21 May 1990
FONSI	21 June 1990

TABLE 2.2

PROPOSED SCHEDULE FOR AN ENVIRONMENTAL IMPACT STATEMENT

Activity	Completion Date
Notice to Proceed	14 August 1989
Internal Scoping and Review of GFI	1 December 1989
Environmental Issues Determination	20 November 1989
Notice of Intent	1 January 1990
Scoping	1 February 1990
Data Collection and Analysis	15 March 1990
Preliminary Draft EIS	2 April 1990
DNA/SDIO-ENEC Review	16 April 1990
Draft EIS	30 April 1990
DNA/SDIO-ENEC Review	7 May 1990
Policy and Security Review	16 May 1990
Publish Draft EIS	21 May 1990
45-Day Waiting Period	5 July 1990
Public Hearings	5 July 1990
Comments Reviewed	5 July 1990
Response to Comments	19 July 1990
Preliminary Final EIS	1 August 1990
DNA/SDIO-ENEC Review	15 August 1990
Final EIS	24 August 1990
DNA/SDIO-ENEC Review	31 August 1990
Policy and Security Review	5 September 1990
Publish FEIS	10 September 1990
ROD	10 October 1990

Data collection and analysis will not be uniform throughout the ROI's defined. Resource analysts will be making assumptions as to which areas within an ROI are measurably impacted and concentrating the data collection/analysis efforts in those areas. Resource analysts will supply a good logical justification of how they moved from the larger ROI to a concentrated area(s) of study. This type of documentation is necessary to satisfy citizens and political representatives that their community/jurisdiction was initially considered and why it is or is not included in the more intensive data collection, impact assessment, and mitigation analysis.

4.2 Level of Impact

An impact is defined as a change in an environment resulting from a proposed action. The LOI is a measure of the magnitude of that change. The magnitude of impacts will be predicted in either an EA or EIS for the SMES-ETM Program.

Elements of LOI include:

- The proportionate degree of change above or below the projected baseline used by the impact;
- The rate of such change; and
- The geographic extent of the change.

Guidelines for assessing impacts include:

- Impacts will be scaled as negligible, low, moderate, or high;
- Impacts on the human and natural environment will be measured whenever possible, not the response of agencies to such impacts (such as through implementation of mitigating measures);
- Impact measures must be easily understood by the public;
- Numerical ranges will not be used without clear justification for their selection;
- Impacts will be described in neutral terms (i.e. not "good" or "bad") and measure both positive and negative changes equally;
- Direct impacts of the alternatives will be distinguished from those that are indirect; and
- If professional or value judgments are made in determining LOI, such judgments shall be made explicit.

4.3 Significance

Significance is a measure of the importance of an impact. Impacts identified as significant must be taken into consideration by the decisionmaker; but not all significant impacts must be avoided. Significance is a function of the interaction between LOI and the context in which the impact occurs. Context represents the various qualitative conditions present in the existing environment which operate to magnify or diminish the importance of the impact. Conditions presented below should be considered to make a determination of significance:

- Whether the impact affects public health or safety;
- Whether the impact is likely to be highly controversial;
- Whether the impact is highly uncertain;
- Whether the impact involves unique or unknown risks;
- Whether the action and its impact may establish a precedent for future actions or represents a decision in principle about a future consideration or policy;
- Whether the action or its impact threatens the violation of some federal, state, or local law or requirements imposed for the protection of the environment; and
- Whether institutional responses to the impact will be extensive.

4.4 Impact Analysis Procedures

The impact analysis procedures to follow are listed as follow:

- Information from the DOPAA will be used for the impact analysis;
- The analysis of impacts should include incorporation of assumed mitigations. In other words, impacts will be eliminated or reduced with the assumed mitigations;
- The analysis of impacts will be performed on reasonably foreseeable significant adverse effects in accordance with 40 CFR 1502.22;
- Both the construction and operation phases will be discussed in the analysis;
- The Socioeconomic Resource will be responsible for providing population projections and allocations. All other resource elements categories use the same numbers and allocations; and
- All impacts discussed will be associated with the impact levels (negligible, low, moderate, and high) and the significant/not significant determination defined in the introduction to Chapter 4.0.

The Impact Summary and an impact summary matrix will be in a separate section for each environmental resource. It will contain an impact summary matrix table which identifies the major impacts discussed under the resource and element headings as identified in the order discussed in the text. For each of the impacts, the level of impact will be identified for the ROI under both the short and long term. To facilitate assimilation of an overwhelming amount of data by the decisionmaker, it is necessary to present data in manageable form. This manageable form often involves some form of aggregation. In order to provide an impact rating for a resource area, the impact ratings of all sub-elements within that resource area must be aggregated. For example, socioeconomics is made up of six sub-elements; employment, population and housing, public services and facilities, fiscal resources, quality of life, and land use. Each of these sub-elements will have an impact rating assigned to it. To determine the overall socioeconomic impact rating, aggregation is required. A degree of value judgement is necessary to make the jump from subelement specific impact rating to overall resource impact rating. The rationale behind the aggregation will be defended to SDIO by the DMSS/Berger team. SDIO-ENEC will review and verify the aggregation rationale prior to formal acceptance of a resource impact rating. Scaling and aggregation of impacts aids in achieving the goal of producing an EA/EIS that is analytic and not encyclopedic. Further, as long as the scaling and aggregation process is undertaken in good faith and without bias, it will serve the NEPA goals of disclosing the environmental impacts of the project and providing the proponent agency, the Congress, and the public, a useful and analytic decisionmaking tool.

4.5 Review Processes, Report Release and Public Comments

Internal Review Process

Before the document is released to the public a structured internal review process will be conducted. Upon completion of the EA or EIS by DMSS/Berger/Sparta, DNA staff and SDIO staff will insure that the documents are appropriate for public distribution. This will entail review by SDIO-ENEC and by DNA and SDIO Program Managers for compliance with EIAP requirements and overall acceptability; DNA and SDIO General Counsel review for legal considerations and nuances; DNA Environmental Office review for compliance with NEPA and other appropriate state and federal environmental laws; and DNA and SDIO Public and External Affairs Offices for coordination with public and private concerns on document distribution and review. Policy and security review will be conducted prior to public distribution.

Report Release

In the event an EIS is developed, a notice of publication shall be placed in the Federal Register along with posted notices to national organizations expected to be interested in the program. Local notices shall also be placed in state and area-wide clearinghouses. The document will be released to the public for review and comment.

An EA is scheduled for release on 21 May 1990. Should an EIS be required, the DEIS will be made public 30 April 1990; FEIS released on 24 August 1990; and publication of the FEIS on 10 September 1990. A public hearing would be held by SDIO/DNA should it be determined that substantial environmental controversy concerning the proposed action clearly exists.

External Review Process

A public notice of completion of the EA will be published and the document will be made available at various public locations for review on or about 21 May 1990. In the event an EIS is developed, copies will be sent to concerned associations and societies like Ducks Unlimited, Sierra Club, etc. Publication of the DEIS will be followed by a 45 day waiting period and a public hearing scheduled for 5 July 1990.

Public Comments

The above series of steps have been established that will insure notification to the public of the proposed action. This notification process will lead to a review and possibly comments by the public on the documents. For both an EA and EIS, written public comments will be received and logged. An EIS will also receive verbal comments through the public hearing process. Verbal comments will be transcribed by court reporters and published in a public comment volume. A public comment report will be developed, and a log of all public comments, identified by issue, will be contained in that document.

Public comments, after being logged, will be sent to the appropriate resource area for evaluation. Comments on policy issues will be forwarded to SDIO-ENEC, while comments on technical issues will be sent to DMSS/Berger/Sparta.

Per NEPA requirements, response to public comments can include: Modification of alternatives or proposed action; consideration of alternatives not previously considered; supplemental, improvement or modification of analysis; factual corrections; and explanation of why comments do not require further response. Each public comment will be reviewed under these criteria for appropriate action.

5.0 Resource Areas

5.1 Biological Resources

5.1.1 Resource Description

This element of the work plan identifies the five biological resource sub-elements to be examined during SMES-ETM EIAP. The five sub-elements consists of the following.

- Vegetation: Major vegetative types, vegetative and dominant species and associations;

- Terrestrial Wildlife: Species of birds, mammals, reptiles and amphibians; habitat preferences, commonality within the area and resident versus migratory;

- Aquatic Resources: Identification of aquatic species and habitats including bottom substitute, depth and width;

- Wetlands: Areas delineated by the National Wildlife Inventory and affected by the project; additional sites examined for wetland characteristics using the Unified Federal Method; and

- Threatened or Endangered Species: Federal and state publications, determine resident or migratory habitats; type and number of species in affected area and location of preferred habitats;

5.1.2 Data Requirements

Data from Secondary Sources

- National Wetland Inventory Maps
- State Wetland Maps
- List of flora and fauna in project area
- List of fish and benthos in aquatic sites
- Soil surveys
- Aerial photographs
- Topographic maps
- Winter bird count
- List of Federal and State Threatened and Endangered Species

Data from Primary Data Collection

- Vegetative species on and adjacent to site
- Vegetation association on site
- Habitats on site
- Presence or absence of wetlands
- Presence or absence of waterbodies
- List of wildlife occurring or likely to occur on site

5.1.3 Assumptions and Assumed Mitigations

5.1.3.1 Assumptions

A variety of assumptions will be made regarding the data to be used in developing the description of the existing environment, developing future trends without the project, and compiling information to be used in the eventual evaluation of potential project impacts. These assumptions relate to the information in the Description of Proposed Action and Alternatives (DOPAA) prepared by SPARTA, Inc., information generated by other resource tasks groups, and information obtained from government agencies and other groups. The assumptions are:

- Estimates of permanent and temporary disturbance as outlined in the DOPAA are correct;
- Additional areas of disturbance can be estimated as appropriate;
- Information obtained from the state Game and Fish Departments, and Divisions of Wildlife is accurate, and;
    1) The latest wildlife distribution maps depict present habitat locations and conditions;
    2) The latest wildlife population and harvest data represent present trends and conditions;
    3) Data on hunting and fishing participation (pressure) rates depict present and future conditions; and
    4) Data on stocking costs and species composition for streams and lakes in the ROI are correct.
- Fenced areas will exclude game and most furbearers from the habitat enclosed;
- Winter-yearlong and yearlong game habitat are basically of equal sensitivity to game species; and
- Human in-migration would increase fishing and hunting pressures within the ROI.

5.1.3.2 Assumed Mitigations

It will be assumed that, in conformance with normal DoD construction practices, certain mitigation measures will be carried out. These measures include provisions to:

- Minimize surface disturbances;
- Revegetate with quick growing native species for short-term soil stabilization;

- Revegetate with native plants for long-term recovery;
- Minimize removal of trees (raptor roosts/nests);
- Conduct education programs to sensitize construction and operational staff on the need to minimize disturbance within and adjacent to the SMES-ETM facility;
- Conduct education and public awareness programs to inform workers on the project of wildlife and fishing regulations, the detrimental effects of illegal hunting and fishing, and the legally protected status of raptors;
- Control dust during construction;
- Avoid disturbance to rare plant populations;
- Restrict vehicle maintenance activities to areas away from stream drainages;
- Minimize erosion and utilize erosion controls during construction activities;
- Restrict use of firearms in construction areas; and
- Minimize the spread of noxious vegetation as appropriate.

5.1.4 Site Visit Activities

Vegetation

Using current aerial photographs (where available) to identify upland areas, a field examination of the upland areas will be conducted. Major vegetative types such as field or woodland will be identified and their boundaries will be determined. Vegetative species will be identified and dominant species and associations noted. The approximate boundaries of the upland vegetation areas will be mapped on the aerial photographs. The presence of threatened or endangered species of plants will be assessed by literature reviews, as well as assessing the site for preferred habitats.

The Consultants will review available information concerning the wetlands in the project area. All wetlands delineated by the National Wetland Inventory (NWI) maps and affected by the project will be identified. The entire project area will be examined to verify mapped wetlands and to determine if any other wetlands, not included on maps, exist within the site. The boundaries of all such wetlands will be determined by using the Unified Federal Method. These wetlands will be approximately located by use on field drawings and aerial photographs. The species of vegetation found in each area will be determined.

Terrestrial Wildlife and Habitats

The Consultant will review existing information concerning the wildlife which potentially inhabit the project area. A limited wildlife field survey will be conducted to determine the species of birds, mammals, reptiles, and amphibians found or expected in the project area. A list will be provided indicating these species, along with their habitat preferences, how common they are in the area, and whether they are resident or migratory. The Consultant will approximately locate major habitats occurring on the site.

The latest U.S. Department of the Interior and State lists of threatened and endangered species will be consulted to determine if any species of these categories could potentially utilize the project area. These agencies will be contacted in order to identify if any of these species or critical habitats exist in or adjacent to the proposed alternatives. The Consultant will approximately locate the preferred habitats of these special status species through field visits and identify such areas on aerial photographs.

Aquatic Biota

The Consultant will review existing information concerning aquatic communities in the project vicinity. Aquatic habitats occurring on or adjacent to the site will be described. Variables described will include bottom substitute, depth and width.

5.1.5 Contacts

- District offices of U.S. Fish and Wildlife Service
- District offices of U.S. Army Corps of Engineers
- State Departments of game, fish and wildlife
- Local ornithology groups
- Soil Conservation Districts
- Industries using Columbia River - fish studies
- State Departments of wetlands
- State Departments of agriculture

5.2 Geology/Water Resources

5.2.1 Resource Description

This element of the work plan identifies the two sub-elements of the geologic resource area to be scrutinized during the SMES-ETM EIAP.

- Geological Conditions: Hazards, energy and mineral resources and soil resources; and

- Seismic Conditions: Physiography, stratigraphy, geologic structure, and regional seismicity.

This work plan identifies requirements for producing an analysis of water resources to be examined during SMES-ETM-EIAP.

- Water Resources: Public water and sewage utilities, including present loading and design capacity, water abstraction rights, sewage disposal and treatment; proposed facility water quality and quantity requirements by type of use; regional and site water resource location, quality, quantity, abstraction, recharge; abstraction rights, availability to purchase or lease additional water abstraction rights.

5.2.2 Data Requirements

The following information is required:

- Description of public water and sewerage utilities in the area, including their present loading and design capacity, water abstraction rights, sewage disposal including treatment;

- Description of existing solid waste disposal facilities, capacities, loading, in the area;

- Proposed facility water quality and quantity requirements, broken down by category (e.g. industrial, domestic);

- Description of solid and liquid wastes generated, quantity;

- Regional water resource location, quality, quantity, abstraction, recharge;

- Present WSMR water abstraction rights, availability to purchase or lease additional water abstraction rights;

- Review additional geological information available in the project area, e.g. from existing mining operations (these apparently exist and information has not been collected);

- Detailed site topography for site drainage study;

- Data from geo-technical field investigations carried out at Orogrande GBFEL site; and

- Review comprehensive permitting requirements.

5.2.3 Assumptions and Assumed Mitigations

5.2.3.1 Assumptions

The assumptions regarding the SMES-ETM EIAP for geology and water resources are as follows:

- The DMSS/Berger team will have access to results of drilling at the candidate sites by Ebasco and Bechtel; and
- The preliminary impact to the candidate sites from seismic risk will be evaluated using the historic seismic record and published probabilistic analyses which relate to certain design acceleration.

Several assumptions are made related to water resource investigations, including:

- Water use factors provided by the DOPAA for project construction will include all water needed for construction;
- State permit requirements for sedimentation ponds, public water supplies, and facilities for wastewater treatment and disposal of wastewater will be followed;
- Water acquisition efforts will follow state water law; and
- A monitoring program to document site-specific impact on groundwater and surface water hydrology and quality will be implemented during construction.

5.2.3.2 Assumed Mitigations

Assumed mitigations consist primarily of procedures or policies normally employed during the construction phase of a large project. For the determination of potential soil impact analysis, assumed normal construction practices include:

- Strip and stockpile topsoil in areas requiring grading, then replace the topsoil when grading or disposal is complete;
- Revegetate disturbed areas with native species as soon as possible;
- Utilize properly designed erosion control practices in any areas left disturbed for extended periods of time to minimize erosion, including erosion along major drainages; and
- Sequence construction, where practical, to minimize large continuously disturbed areas, especially those oriented parallel to the prevailing winds.

Certain mitigations are part of standard DoD construction practices or policy. For potential water resources impacts these will include:

- Compensation to current water users who may be impacted during project construction;
- Minimization of site disturbance and employment of proper revegetation techniques to reduce erosion potential;
- Construction of stormwater detention and erosion control facilities to control increased surface runoff impacts; and
- Development of water supply and waste disposal facilities for project-related facilities consistent with legal requirements.

5.2.4 Site Visit Activities

(1) Obtain name, address, phone number, contact person, for each of the agencies involved or potentially involved in supplying, operating, and legislating any of the resource areas affected by the proposed SMES-ETM operation, for each of the alternative sites. Preliminary information to be obtained during the introductory visit to the installations.

(2) Contact each of the above agencies, and set up appointments for the period of field work (18 Sept - 13 Oct).

5.2.5 Contacts

- Township and County Offices (local legislation/zoning requirements, and information on any mining companies in the area who could be a source of geological information)
- In-state department responsible for environmental protection, for all permitting requirements, well locations, water rights
- U.S. Bureau of Mines office (if available) for information on mining operations in the area
- Water and sewerage utility companies

USGS offices at:

503 National Center
Room 1-C-402
12201 Sunrise Valley Drive
Reston, VA 22092

Lamont Doherty Geological Observatory, Palisades, NY (seismic data)

5.3 Air/Noise Resources

5.3.1 Resource Description

Air quality and noise levels are to be examined as separate entities in the development of the SMES-ETM EIAP. For this work plan, sub-elements of these resource areas have not been developed. After internal scoping it was determined that a further level of detail in these areas would not be warranted. However, if during the course of the analysis it is determined that sub-elements should be included, they would then be identified as appropriate.

- Air Quality: Air Quality is a descriptive measure of the cumulative quantity of pollution in the air. The EIAP will evaluate air qualities at the respective sites potentially impacted by construction and operation of the SMES-ETM. The EIAP will focus on existing air quality conditions, future trends without the SMES-ETM project, and project impacts. Pollutant studies will treat fugitive dust from such activities as disturbance of overburden, erosion and vehicular travel; carbon monoxide (CO) concentrations resulting from transportation sources; and regional emissions from additional mobile and stationary sources; and

- Noise Levels: Noise is defined as any sound considered undesirable. The evaluation of noise levels for this study will include both present and projected transportation noise sources (vehicular, rail, and air traffic), as well as construction related noise sources.

5.3.2 Data Requirements

Data from Secondary Sources

- Air quality data from State monitoring stations
- Noise levels for projects in project area
- State Implementation Plans (SIP)

Data from Primary Sources

- Noise levels on and adjacent to site

5.3.3 Assumptions and Assumed Mitigations

5.3.3.1 Assumptions

The assumptions for air quality and noise analyses include:

- Existing climatological data are assumed to be representative of the candidate sites; and
- Project related assumptions based on the DOPAA are assumed to be accurate.

5.3.3.2 Assumed Mitigations

Procedures for mitigating air quality impacts will be directed primarily towards suppression of fugitive dust emissions as follows:

- Application of chemical palliatives to unpaved roadway surfaces, storage piles, and other high-suspension dust sources (standard construction practices);
- Revegetation of disturbed areas; and
- No mitigations will be assumed in analyzing the impact on noise levels.

5.3.4 Site Visit Activities

Noise monitoring will be conducted at several locations on and adjacent to the project site if necessary.

5.3.5 Contacts

- State departments of air quality or health
- State Departments of Transportation

5.4 Socioeconomic Resources

5.4.1 Resource Description

This element of the work plan identifies the eight socioeconomic resource areas to be examined during SMES-ETM-EIAP.

- Population: Region, county and municipality; classification by age, sex; demographic characteristics (household formation and structure);
- Land Use: Category and ownership; recent zoning and proposed changes;
- Employment: Region and county by industrial sector; commuting employee patterns; major regional employers by occupational characteristics; labor force characteristics (unemployment, labor force participation, occupational availability); personal income by industrial sector; construction worker wage rates;
- Public Service and Facilities:
  - Education - Elementary, junior and senior high schools; special education facilities; parochial schools; enrollment, capacity, staffing, and operating budgets by district;

- Law Enforcement - Municipal police departments and county sheriff departments; staffing, crime rates, operating budgets by agency;

- Fire Protection - Municipal fire departments and rural fire districts; staffing, equipment and operating budgets by agency;

- Housing - Existing housing stock within areas that constitute the primary and secondary region of influence; capability of local housing producers within the primary and secondary regions of influence to respond to changes in demand, thereby altering housing stock characteristics;

- Health Care - Public and private primary health care facilities including local and military hospitals, emergency medical services systems, special health provision units, numbers of medical personnel by type; hospital occupancy and capacity by facility;

- Human Services - Agencies of the state and local departments of social services; private social service agencies; staffing, capacity, operating budgets;

- General Government - Other public services provided by local governments, focusing on general governmental administration and maintenance services; staffing, service provision, operating budget by jurisdiction;

- Fiscal Resources: Increased manpower and physical plant requirements needed to maintain public agency responsibilities; municipal and county governments; human services; health care; fire protection; law enforcement; education; and

- Quality of Life: Impacts of the SMES-ETM on individuals' perceptions of social well-being and impacts that may affect interaction with other persons; characterized by social integration, or lack thereof, of individuals and/or groups within a community;

5.4.2 Data Requirements

Data acquisition will focus upon secondary data primarily available from published documents. The following information will be collected:

- Total population for communities and counties
- Population by age by county
- Demographic characteristics (household formation and structure)
- Housing Stock Characteristics (unit mix, vacancy rates, prices, recent and current building activity)
- Land use by category and ownership

- Recent zoning and proposed changes
- County-level employment by industrial sector
- Major regional employers
- Occupational characteristics of major employment sectors
- Labor force characteristics (unemployment, labor force participation, occupational availability, commuting patterns)
- Personal income by industrial sector
- Construction worker wage rates
- School enrollment, capacity, staffing, and operating budgets by district
- Law enforcement staffing, crime rates and operating budgets by agency
- Fire protection staffing, equipment, and operating budgets by agency
- Health care staffing, hospital occupancy and capacity by facility
- Electric and gas utility usage, capacity, and operating budgets by public entity
- Inventory of human services agencies
- General government staffing, service provision, and operating budget by jurisdiction
- Inventory of recreational activities

5.4.3 Assumptions and Assumed Mitigations

5.4.3.1 Assumptions

- The primary assumption is that no events are assumed to occur through the study period under baseline conditions that would alter the existing socioeconomic profile of the study area;
- No existing program or agencies will be eliminated or new ones added;
- Present service levels will be maintained under baseline conditions;
- Analysis will be conducted using a per capita approach;
- The three primary housing types are single family, multifamily, and mobile home;

- Individuals directly affect the service delivery function of public services and facilities;
- Public services will remain available for all residents within a specific governmental jurisdiction;
- Service levels will remain at current levels when forecast under baseline conditions;
- Commuting patterns for construction and operation workforces will be 100 miles and 30 miles respectively; and
- Available labor in ROI will be utilized to the extent possible prior to modeling worker in-migration.

5.4.3.2 Assumed Mitigations

There are no assumed mitigations for the Socioeconomic Resource.

5.4.4 Site Visit Activities

A major goal of the site visitation plans will be to establish criteria for delineating the regions of influence (ROI). This will, in turn, determine the geographic extent of data collection.

With the exception of land use, the general commuting boundaries for the project construction and operational work force will dictate the ROI for the socioeconomic elements. Interviews with local employment offices and local officials as well as reviewing the past project experience (particularly construction) in the area will be vital to determining these boundaries. With respect to the land use element, it is assumed that the ROI boundaries will be determined by the 5 or 10 gauss limit for the primary impact area.

Visits to local chambers of commerce and economic development agencies will also be important. These entities typically provide literature specifically identifying agencies responsible for various community services (i.e., the names of school districts, fire districts, etc.) which will be a starting point for our data collection in these resource elements. These sources may also be useful in identifying individuals knowledgeable about local real estate conditions.

5.4.5 Contacts

- Local state labor force/unemployment offices
- Chambers of commerce
- General government budget offices
- School district administrative offices

- Local planning departments
- Real estate agents
- Law enforcement districts
- Fire protection districts
- Public utility companies

5.5 Utilities/Energy Resources

5.5.1 Resource Description

This element of the work plan discusses four sub-elements as illustrated below. These four sub-elements will be examined in detail during execution of the SMES-ETM EIAP.

- Electric Utilities/Telephone/Pipeline: Distribution; sources; conditions; classification by size and category; proposed upgrades and/or modifications;
- Magnetic Fields: Classification by type; location and size of exposure;
- Energy Resources: Location, classification by type and quantity; and
- Industrial and Construction Resources: Material sources and material costs.

5.5.2 Data Requirements

Data requirements for Utilities/Energy Resources include:

- A layout showing facility and power connection to grid indicating the line voltage
- Map showing isograms of field strengths under maximum operating conditions
- Map showing electro-magnetic radiation levels at 2 meter (6 foot) elevation
- A description of proposed operating parameters

5.5.3 Assumptions and Assumed Mitigations

5.5.3.1 Assumptions

There are no assumptions for Utilities/Energy Resources.

5.5.3.2 Assumed Mitigations

There are no assumed mitigations for Utilities/Energy Resources.

5.5.4 Site Visit Activities

Site visit activities will consist primarily of field contacts with host utility companies and state utility commissions as well as state departments whose areas of responsibility are energy resources.

5.5.5 Contacts

Utilities:

- Electric utility(s) serving local communities;
- Telephone company(s) serving facility and local communities;
- State agency responsible for regulating oil and gas pipelines (probably the Public Utilities Commission).

Energy Resources:

- State agency responsible for mapping energy (and mineral) resources

Industrial & Construction Resources:

- Local Chamber of Commerce or development office

5.6 Transportation

5.6.1 Resource Description

This element of the work plan discusses transportation as it will be examined in the SMES-ETM EIAP. Transportation is defined as the various modes of travel used for the safe and efficient movement of personnel and goods.

- Road System: Identification; functional classification and environment; significant intersection characteristics; cross-section characteristics (number of lanes and width, median and shoulder types and widths); alignment characteristics (average slope and curvature; maximum slope); constraints (height and lateral clearance restrictions; weight restrictions on structures); traffic (daily and peak hour volume and composition; growth rates); and network improvements;
- Railroads: Identification; functional classification and environment; alignment characteristics; constraints; traffic and network improvements;

- Airports: Identification; classification by size and capacity; and
- Public Transportation: Type; frequency and routes; and carrying capacity.

5.6.2 Data Requirements

As stated in the GFI data summary review, analysis of the SMES-ETM transportation impacts requires identification and inventory of regional and local transportation facilities likely to be used by project-related demand, either construction- or operation-generated, together with a quantitative description of facility characteristics in sufficient detail to evaluate their ability to meet the demand and to calculate the resulting impacts. All transportation modes serving the site or its vicinity should be considered (road, rail, air, waterway), but of course the particular data required depends on the mode considered.

For the specific case of roads, data needed to calculate traffic impacts include: identification; functional classification and environment; significant intersection characteristics; cross-section characteristics (numbers of lanes and width; median and shoulder types and widths); alignment characteristics (average slope and curvature; maximum slope); constraints (height or lateral clearance restrictions; weight restrictions on structures); traffic (daily and peak hour volume and composition; growth rates); and network improvements likely to be implemented before the end of the SMES-ETM project. In general, information should be sufficiently detailed to carry out a level of service analysis following 1985 Highway Capacity Manual procedures.

Demand-related data is less site-specific although, as mentioned above, some data should be collected in coordination with the socioeconomic analyses. This includes the likely geographic source of construction materials and equipment; secondary transportation requirements of the personnel relocated to the proposed site area; and the likely number, frequency of visits and place of origin of temporary staff.

5.6.3 Assumptions and Assumed Mitigations

5.6.3.1 Assumptions

- Travel related data (peak hour traffic, traffic volume, relative travel speed, etc.) from local governments is representative of the candidate sites.

5.6.3.2 Assumed Mitigations

There are no assumed mitigations for the Transportation Resource.

5.6.4 Site Visit Activities

- Overall familiarization with the transportation system serving the proposed site location;
- Discussion with personnel involved in transportation systems operations and planning;
- Collection of detailed transportation system data required for impacts analysis; and
- Assessment and collection of site-specific demand related data, to be carried out in coordination with the socioeconomic analysis.

5.6.5 Contacts

- State or local Public Works engineers involved in operating and planning the road network;
- Other modal authorities, as required; and
- Personnel responsible for existing internal transportation networks at certain sites (i.e., the internal road network at White Sands; the internal road and rail networks at Badger AAP and BPA Hanford Reservation.

5.7 Hazardous Wastes

5.7.1 Resource Description

This element of the work plan identifies non-radioactive and radioactive hazardous wastes to be examined during the SMES-ETM EIAP.

- Non-radioactive Wastes: Size and location, open or closed; classification by type; and
- Radioactive Wastes: Size and location; open or enclosed; classification of radioactive wastes; chemical description.

5.7.2 Data Requirements

Data Acquisition: Data is anticipated to be in the form of published reports and summary data, supplemented by interview summaries that will be referenced in the SMES-ETM EA as personal communications. Reports are expected to include contamination assessments, remedial investigation reports, and RCRA compliance plans.

5.7.3 Assumptions and Assumed Mitigations

5.7.3.1 Assumptions

- Well logs and other monitoring results are considered accurate and reflective of general conditions in the site areas.
- Any RECRA and/or CERCLA activities and mitigations are considered the responsibility of the host candidate site. DNA will be responsible for assessing RECRA and CERCLA activities relating to the SMES-ETM.

5.7.3.2 Assumed Mitigations

There are no assumed mitigations for the Hazardous Waste Resources Area.

5.7.4 Site Visit Activities

Site visit activities to evaluate hazardous waste will be primarily office visits, supplemented by a brief walk-over of the site proposed for the SMES-ETM for familiarization purposes. No in-field data gathering is anticipated.

An interview with the installation's environmental officer will be conducted to determine the current status of environmental compliance planning/investigation at the site, the location of records pertaining to hazardous waste, and the extent that records or reports are maintained at other locations. Records/reports that are available on-site will be reviewed and relevant materials identified for copying and forwarding to DMSS/Berger. For materials that are not available for review, a point of contact will be obtained for subsequent telephone follow-up. Because the BPA Hanford site is proximate to Superfund sites being investigated by EPA, telephone contact will be made with the EPA Project Officer, and available documents requested. A similar telephone contact is proposed to EPA regarding the Badger site, as a backup to information acquired at the site.

The above applies to BPA Hanford and BAAP. At the other three sites, the Geology/Water Resource would be appropriate to assess the potential for hazardous waste impairment. Due to the proximity of the Orogrande site to the WSMR site, an overview of potential hazardous waste impairment at both sites can be obtained from the environmental officer at WSMR. This is due to the common hydrogeologic basins shared by the two sites. This would be supplemented by interviews with the environmental staff at BLM who have responsibility for Orogrande. For the TU Electric site, TU's environmental staff would be interviewed regarding past and present activities at the site, and the potential for environmental impairment.

5.7.5 Contacts

BPA Hanford

- Environmental Office at the BPA Hanford Reservation (visit)
- Superfund Office at EPA Region 10 in Seattle (telephone)

Badger AAP

- Environmental Office at BAAP (visit)
- EPA Region 5 office in Chicago (telephone)

WSMR

- Environmental Office at WSMR (visit by other team member)

Orogrande

- Environmental Office at WSMR - see above
- BLM local office (visit by other team member)

TU

- TU's Environmental Department (visit by other team member)

5.8 Cultural Resources

5.8.1 Resource Description

As used in this plan, the term cultural resource is defined as any district, structure, site, building, or object dating to the prehistoric or historic period, which possesses significance as defined by the Native American Religious Freedom Act and/or meets or has the potential to meet the criteria for inclusion in the National Register of Historic Places. Criteria of significance as defined the National Register include the following:

- Association with broad historical trends or patterns or with events important in the past;
- Association with individuals important in the past;
- Example of a type or method of construction, work of a master, or embodying high artistic values; and
- Possessing the potential to contain information important to the history or prehistory of the locality, region, state, or nation.

It is important to note that significance is operational at a variety of geographical levels, or "scales," ranging in scope from the immediate locality to the nation. Typically excluded, however, are properties less than 50 years of age, cemeteries, and properties primarily commemorative in value.

In general, the process of identification and evaluation of cultural resources relies on the regulations and procedures set forth in 36CFR800, which implement Section 106 of the National Historic Preservation Act, as amended. The 106 process proceeds through a series of stages, which require progressively higher

levels of documentation. Phase I studies provide sufficient information to (i) characterize existing conditions and (ii) identify all sites within the project area such that proposed plans can be evaluated for impact on cultural resources contained within a proposed development site.

Phase I studies can be broken down into two sub-phases: Phase Ia and Ib. At the Ia level, existing conditions are characterized through a literature review (minimally site/structure records, consultation with the State Historic Preservation Officer [SHPO], and limited historical research) and an inspection of the proposed development site. At the Ib level, intensive survey, i.e., systematic archaeological field work, is implemented

At the Phase II level, sufficient information is collected to determine whether or not a resource (i.e., district, site, building, structure, or object, usually identified during Phase Ia or Ib studies) meets the criteria for inclusion in the National Register. This finding is typically summarized in a report, which is submitted for review to the State Historic Preservation Officer (SHPO). If the resource is considered eligible for inclusion by the SHPO, and if the proposed undertaking will have an adverse effect upon it, then a Memorandum of Agreement is developed, which sets forth appropriate mitigative procedures, which are considered the Phase III studies.

5.8.2 Data Requirements

Prior to the initiation of field work, we shall require the following:

- Maps of the facilities, preferably marked to show the probable or proposed development sites; and
- The names of the environmental officers on the respective installations who have responsibility for Section 106/cultural resource planning and compliance.

5.8.3 Assumptions and Assumed Mitigations

5.8.3.1 Assumptions

It is assumed that all SMES-ETM related activities will occur in coordination with the existing Comprehensive Cultural Resources Management Plan (CRMP) at BPA Hanford, WSMR, and BAAP as well as existing state plans in New Mexico, Washington, Wisconsin and Texas. Where appropriate these activities may serve to amend the CRMPs investigative procedures and will conform to standards established by the Secretary of the Interior (Federal Register), September 29, 1983, Vol. 48, No. 190, pp. 44716-44742), Advisory Council on Historic Reservation (36CFR800), the respective states, and concerned federal agencies (e.g., Department of Energy).

In general, it is the federal government's policy to avoid adverse impacts to significant cultural or paleontological resources. Aside from this overall policy direction, no other assumptions concerning mitigation measures are made.

5.8.3.2 Assumed Mitigations

Mitigation plans must be formulated on a site-specific basis after a formal determination of effect. While avoidance of impacts is a preferred mitigative measure in most instances, situations may arise in which this alternative is either unfeasible or results in an increased level of adverse impacts elsewhere. Where such adverse effects cannot be avoided, it is assumed that other measures (e.g., preservation or on-site data recovery) will be implemented in accordance with appropriate legislative guidelines (e.g., 36 CFR 800).

5.8.4 Site Visit Activities

At each SHPO, DMSS/Berger will review all pertinent reports and consult either with the SHPO or the designated representative concerning the subsurface potential of the proposed location. This review will address information deficiencies in the GFI, which have been previously discussed. Historic maps will be examined for information on potential archaeological sites (e.g., mills, farmsteads) and past land uses that may have affected the preservation potential of the subject development area. At each site, LBA will tour the installation to consider land use, evidence of past disturbances, future uses, vegetation, and environmental features. Black-and-white photographs will be taken as appropriate and as permitted.

Under Executive Order 11593 as well as Section 110 of the National Historic Preservation Act, executive agencies of the federal government are required to develop cultural resource management plans for properties within their jurisdictions. Thus, U.S. military installations (e.g., WSMR, Badger) may have planning documents on file. LBA will also confer with individuals on the respective sites with responsibility for cultural resource compliance/planning activities.

5.8.5 Contacts

Jennifer Kolb
State Historic Preservation Officer
and Director
Historic Preservation Division
State Historical Society
816 State Street
Madison, Wisconsin 53706
608-262-2970

Curtis Tunnell
Executive Director
Texas State Historical Commission
P.O. Box 12276 - Capitol Station
Austin, Texas 78711
512-463-6100/6096

James Bruseth, Ph.D.,
Deputy SHPO
Wayne Bartholomew,
Staff Archaeologist

Jacob E. Thomas
State Historic Preservation Officer
Office of Archaeology and Historic Preservation
111 West 21st Avenue, KL-11
Olympia, Washington 98504
206-753-4011

Thomas W. Merlan
State Historic Preservation Officer
Office of Cultural Affairs
The Villa Rivera
Room 101
228 East Palace Avenue
Santa Fe, New Mexico 87503
505-827-8320

6.0 Scoping, Contact Clearance and Reporting Procedures

6.1 Scoping

During the Environmental Assessment process, internal scoping will be conducted in order to determine the salient environmental issues involving the construction and operation of a SMES-ETM. The internal scoping consists of reviewing the Government Furnished Information (GFI), obtaining and reviewing additional information for each of the candidate sites, literature review of technology specific articles, and site visit observations and interviews. Should DNA and SDIO elect to proceed with an EIS, additional scoping activities will occur. These activities will include; solicitation of comments from interested organizations, agencies, and local jurisdictions, as well as holding public meetings at each of the candidate sites. The extent, timing, and procedures for conducting those activities would be presented in a Scoping Plan that would be attached as an amendment to this EIAP Implementation Plan.

6.2 Contact Clearance and Reporting Procedure

Contact clearance and the reporting of results in a timely manner is intended to serve the following purposes:

- To provide a mechanism to organize the work effort by drawing upon up-to-date information about data collection results and to make the most efficient use of data collection activities;
- To inform SDIO about information needs and intended field visits and activities;

- To reduce the impact on those from whom information is collected. By planning and managing the time and effort associated with requests for information to state, county, and local parties, the impact on them can be minimized; and

- To document and build a record of the information collected and how it is employed in the EIAP.

The Clearance Request and Contact Report process applies to all DMSS/Berger and SPARTA personnel involved in the SMES-ETM EIAP. Clearance for field visits is required. All contacts will be reviewed bi-monthly by SDIO-ENEC. Contact that provide major issues, policy implications, etc. will be reviewed immediately. Formal contact with host installations and all potential jurisdictions will be initiated by DNA. All subsequent written communication to agencies will be copied to SDIO. Written communications, contact reports, and clearance requests will be maintained in a project logging and tracking system. Clearance for telephone contacts is not required. All contacts will be reviewed bi-monthly by SDIO-EMES. Contacts that provide major issues, policy implications, etc. will be reviewed immediately. Formal contact with host installation and all political jurisdictions will be initiated by DNA. All subsequent written communications to agencies will be copied to SDIO. Written communications, contract reports, and clearance requests will be maintained in a project logging and tracking system. A Clearance Request Form and a Contact Report Form are provided (Figures 6.1 and 6.2).

Access to the three federal installations (BPA Hanford, WSMR, and BAAP) will be coordinated with the designated contact at each facility. Specific access requirements, such as badging, will be based on the existing procedures at the installations. Access to private land holdings will require a process of notifying the landowner of the intent or interest in access and explanation of field studies expected on the lands. The first level of contact with a landowner will be through a letter of introduction from SDIO. Access to public lands will be in accordance with all local and state laws applicable to the area being investigated.

FIGURE 6.1

ENVIRONMENTAL IMPACT ANALYSIS
CLEARANCE OF PROPOSED CONTACT

1. Submitted By: _____

2. Date Submitted: _____

3. Agency or Organization
   to be Contacted: _____

4. Person or Office
   to be Contacted: _____

   _____

5. Date of Proposed Contact: _____

6. Purpose of Contact: _____

   _____

   _____

7. DMSS/BERGER/SPARTA Personnel
   to be Present: _____

   _____

   _____

8. Others Proposed to be Present: _____

   _____

   _____

9. Other Pertinent Information: _____

   _____

   _____

   _____

   _____

   _____

   _____

10. Authorization Received: _____

FIGURE 6.2

LOUIS BERGER AND ASSOCIATES, INC.
SDI CONTACT FORM

DATE: _____

NAME OF CONTACT: _____

ORGANIZATION: _____

LOCATION: _____

TYPE OF CONTACT: ____ Telephone ____ Meeting

DISCUSSION: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

CONTACT MADE BY: _____

SIGNATURE: _____

7.0 SMES-ETM EA/EIS Outline

SMES-ETM EA/EIS OUTLINE

SUMMARY

1.0 Purpose and Need for Action

- 1.1 Introduction
- 1.2 Purpose
- 1.3 Need for Proposed Action

2.0 Proposed Action and Alternatives

- 2.1 Description of Proposed Action
  - 2.1.1 Description of Proposed Action
    - 2.1.1.1 Introduction
    - 2.1.1.2 Concept
  - 2.1.2 Construction
    - 2.1.2.1 Schedule and Scope
    - 2.1.2.2 Trench Excavation
    - 2.1.2.3 Coil
    - 2.1.2.4 Power Conditioning System
    - 2.1.2.5 Cryogenic System
    - 2.1.2.6 Operations Building/Control Facility
  - 2.1.3 Operations
  - 2.1.4 Failure
  - 2.1.5 Decommissioning
- 2.2 Alternatives to the Proposed Action
  - 2.2.1 Alternative Power Sources
- 2.3 Siting Alternatives of the Proposed Action
  - 2.3.1 Introduction
  - 2.3.2 White Sands Missile Range, New Mexico
  - 2.3.3 Orogrande, New Mexico
  - 2.3.4 TU Electric Monahans, Texas
  - 2.3.5 Badger Army Ammunition Plant, Wisconsin
  - 2.3.6 BPA BPA Hanford Reservation, Washington

3.0 AFFECTED ENVIRONMENT

- 3.1 Introduction
- 3.2 WSMR Site, New Mexico
  - 3.2.1 Biological Resources
    - 3.2.1.1 Vegetation

3.2.1.2 Terrestrial Wildlife
3.2.1.3 Aquatic Resources
3.2.1.4 Wetlands
3.2.1.5 Threatened or Endangered Species
3.2.2 Geology/Water Resources
3.2.2.1 Geological Conditions
3.2.2.2 Seismic Conditions
3.2 2.3 Water Resources
3.2.3 Air/Noise Resources
3.2.3.1 Air Quality
3.2.3.2 Noise Levels
3.2.4 Socioeconomic Resources
3.2.4.1 Employment
3.2.4.2 Population and Housing
3.2.4.3 Public Services and Facilities
3.2.4.4 Fiscal Resources
3.2.4.5 Quality of Life
3.2.4.6 Land Use
3.2.5 Utilities/Energy Resources
3.2.5.1 Electric Utilities/Telephone/Pipelines
3.2.5.2 Magnetic Fields
3.2.5.3 Energy Resources
3.2.5.4 Industrial and Construction Resources
3.2.6 Transportation
3.2.6.1 Road System
3.2.6.2 Railroads
3.2.6.3 Airports
3.2.6.4 Public Transportation
3.2.7 Hazardous Wastes
3.2.7.1 Non Radioactive Wastes
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5.0 REFERENCES

6.0 LIST OF PREPARERS

7.0 COORDINATION WITH OTHERS

8.0 APPENDICES (as necessary)

8.1 SITING PROCESS

APPENDIX A

GENERAL DESCRIPTION OF THE SUPERCONDUCTING MAGNETIC ENERGY STORAGE (SMES-ETM) SYSTEM

GENERAL DESCRIPTION OF THE SUPERCONDUCTING MAGNETIC ENERGY STORAGE (SMES) SYSTEM

1.0 INTRODUCTION

The Strategic Defense Initiative Program includes an advanced technology experiment project, the Superconducting Magnetic Energy Storage-Engineering Test Model (SMES-ETM), which develops a very large magnetic field as an energy storage device. For a Strategic Defense System (SDS), a SMES system could provide power for ground-based directed energy weapons. Furthermore, since 1970 a number of researchers have studied promising SMES applications to perform or enhance important functions for electric utilities.

The purpose of the SMES-ETM is (1) to demonstrate the technical, functional and economic feasibility of a full scale SMES unit for support of SDS applications and operations and (2) to demonstrate the technical, functional and economic feasibility of a full scale SMES unit to support an electric utility network.

The SMES-ETM is funded by the Strategic Defense Initiative Organization (SDIO) with support from the Electric Power Research Institute (EPRI). The Defense Nuclear Agency (DNA) is managing the program for SDIO. Two competing contractor teams headed by Bechtel National, Inc. and Ebasco Services, Inc. are developing detailed SMES-ETM designs. One of the teams will be awarded a construction and testing contract in November 1990. Five sites for the SMES-ETM are under consideration. These are (1) White Sands Missile Range, NM, (2) Orogrande, NM, (3) Monahans, TX, (4) Badger Army Ammunition Plant near Baraboo, WI, and (5) the U.S. Department of Energy's Hanford Reservation near Richland,

WA. The final site selection will be made in conjunction with the selection of the construction contractor.

2.0 CONCEPT

SMES is a technique for storing electrical energy in large, football field size coils. The SMES coil can be charged with electricity when demand is low and later discharged during peak power consumption periods. In simple terms, this is equivalent to pumping water into an elevated reservoir at night and using the release of the stored water to provide additional generating capacity in the morning.

The SMES-ETM will actually store its energy in the magnetic field formed by electric current flowing in a superconducting solenoidal coil. The dimensions, shape and current capacity of the superconducting coil will be determined, in part, by the energy storage requirement. The SMES-ETM will be designed to store approximately 20 MWh of energy. The energy stored in the coils is equal to $(\frac{1}{2})(LI^2)$ where I is the current and L is the self inductance of the coil. The inductance is a function of the coil geometry and physical size. A solenoid geometry coil is usually selected for reasons of cost.

The current in the coil is carried in a conductor which consists of strands of superconducting wire configured in an appropriate stabilizing medium. The conductor is coiled in a liquid helium bath to keep it below the critical superconducting temperature. A refrigeration and thermal insulation system is required to maintain the appropriate coil temperature.

A thermal barrier is provided by a series of tube walls carrying cryogenic fluids (helium and nitrogen), thermal insulation, and a vacuum maintained by an

outer enclosure which acts as a vacuum vessel or dewar. The refrigeration system is the main auxiliary power requirement for the SMES.

The charged coil exerts a large Lorentz (magnetic) force which acts radially outward. The generally accepted preferred design concept is to locate the SMES coil in a circular trench so that the radial force will be resisted and contained by the outer walls of the trench. The optimum diameter and height of the coil varies with the energy storage capacity as noted above and with the ability of the trench walls to resist the cyclic radial loads. Structural elements are required to transfer the magnetically induced radial forces to the local soil or rock medium which carries the load. These structural elements are to be made of materials with low thermal conductivity so as not to transfer heat from the surrounding earth into the helium.

Energy is transferred between the coil and the power grid or other designated application by means of a power conditioning system which consists of solid state conversion elements arranged in an appropriate configuration. For compatibility with the 3 phase electric utility system, the power conditioning system will consist of an ac-to-dc rectifier and a dc-to-ac invertor. The details of the power conditioning system will depend on the characteristics of the load or system application; in its simplest form, it would incorporate six thyristors or gate turn on (GTO) devices controlled by a firing circuit.

Figure 2-1 show the main SMES features outlined above. Figure 2-2 and Figure 2-3 show a plan view of a generic SMES plant and an artist's sketch of a SMES plant, respectively. Figure 2-4 is a representation of the basic electrical circuit for a SMES unit.

3.0 PURPOSE

3.1 For SDIO, SMES is a candidate power supply concept for high power ground-based lasers (GBLs). GBLs may require 1000 MW per laser, on literally a minute's notice and for periods exceeding one hour. A study of GBL power requirements and options concluded that batteries and SMES are the best options for SDIO needs. SMES is projected to be the more cost effective at GBL power levels. These projections are based on conceptual and analytical studies and not on direct empirical evidence. For that reason, SDIO is conducting the SMES-ETM program in order to verify cost and performance projections.

3.2 For electrical utilities, the most obvious use of SMES systems will be for load leveling. The actual benefits to specific utilities will depend on the size and characteristics of the utility. SMES also offers benefits in all of the following areas: ramping, set points, system stability, spinning reserve, VAR control, black start, and capacity value. Estimates of the gross benefits (not including SMES capital and operating costs) to utilities operating a SMES the size of the SMES-ETM range from $100,000/year for a 200 MW utility to about $7 million/year for a 23,000 MW utility.

4.0 REQUIREMENTS

4.1 The SDIO requirements for the SMES-ETM and for a full size SMES capable of powering an operational ground-based laser are listed in the following table:

SDIO Requirements	ETM	Operational
Pulse Power Level (MW)	400	1000
Deliverable Energy (MWHr)	20	1200
Power Ramp Time (Sec)	5-180	5-180
Base Load Duration (Sec)	100	4320

4.2 The utility industry requirements on SMES units have not been stated in terms comparable to the SDIO requirements. Nonetheless, as noted above, the SMES concept offers significant potential benefits to utilities. To utilities it promises to satisfy requirements of simplicity, high efficiency, rapid response, low maintenance and attractive costs.

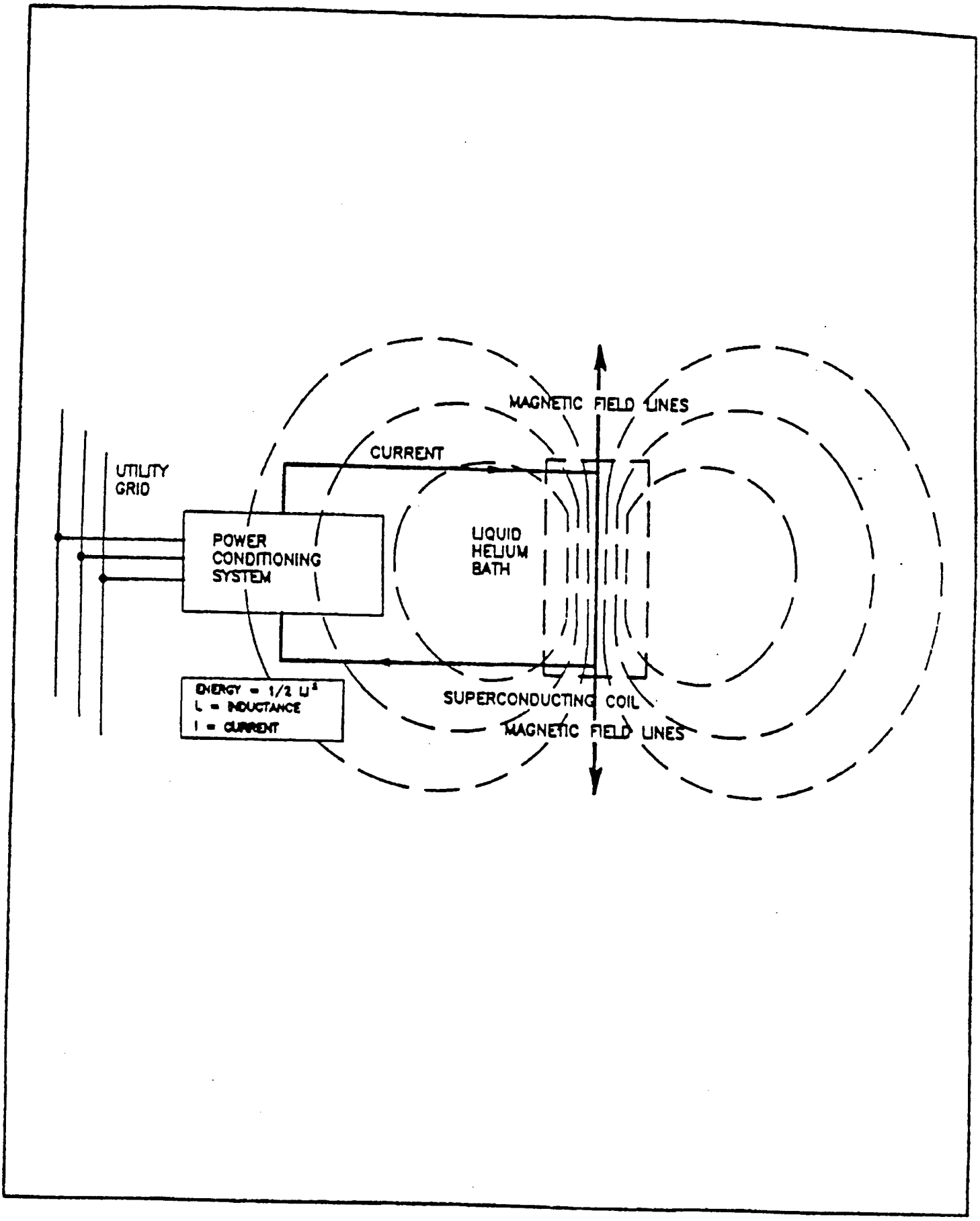

Figure 2-1. SMES Principles of Operation

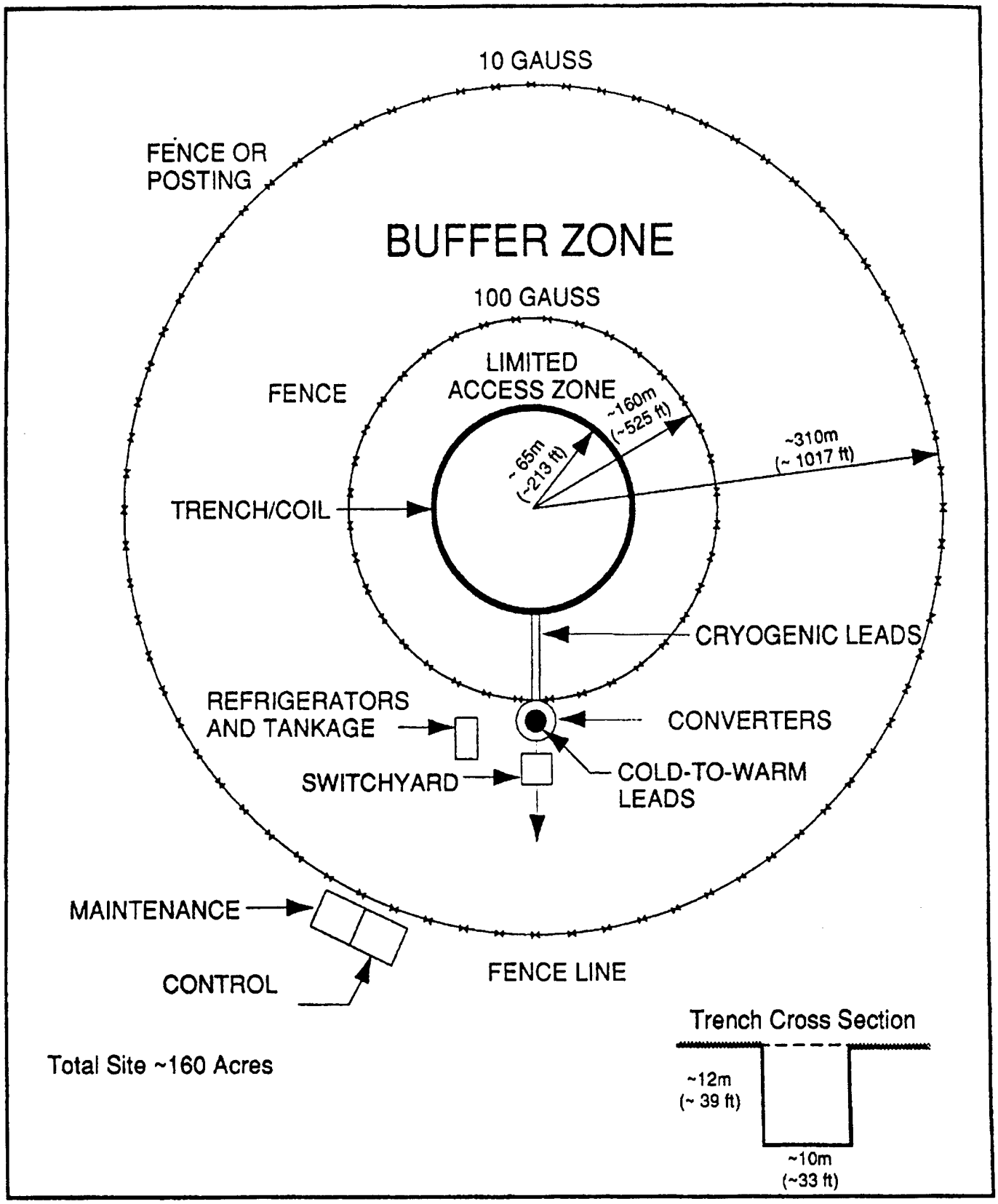

Figure 2-2 Plan View of Generic SMES Plant

WPD L217

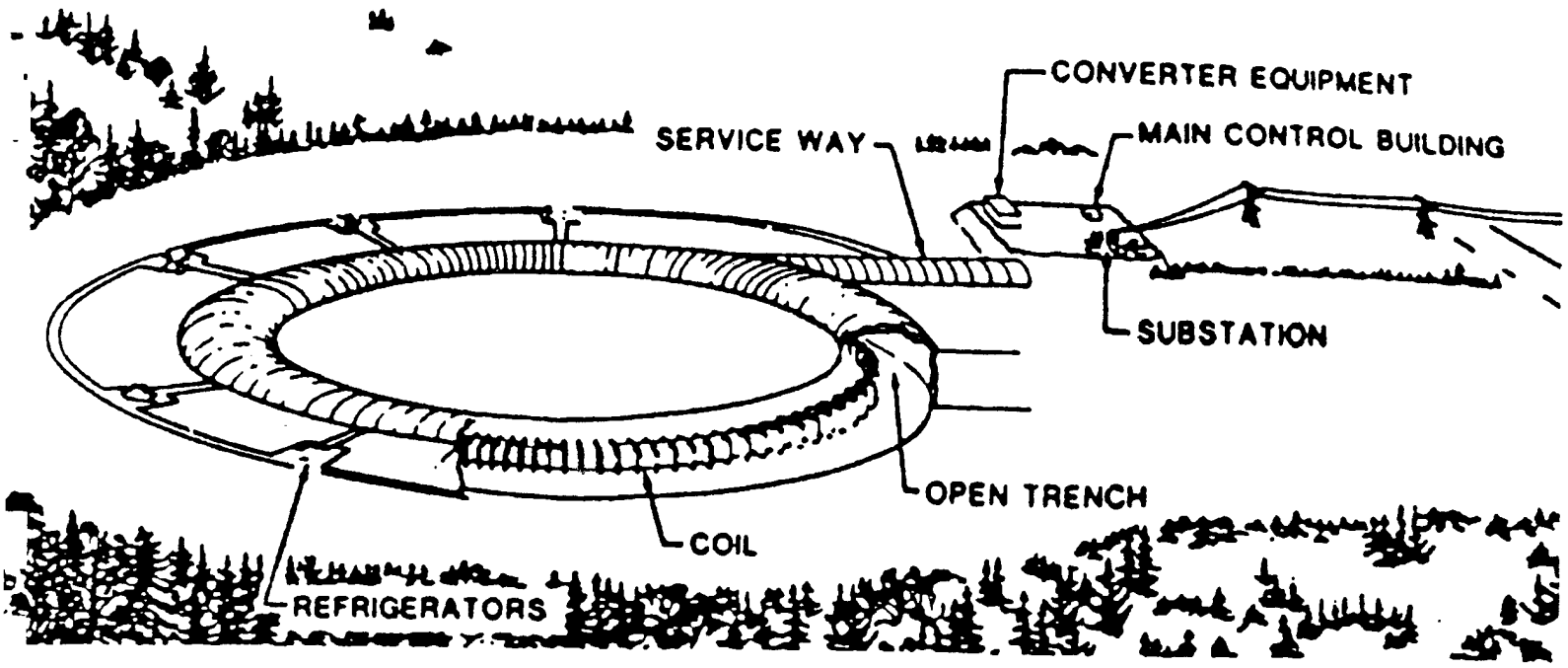

Figure 2-3. Artist's Sketch of a Small SMES Unit

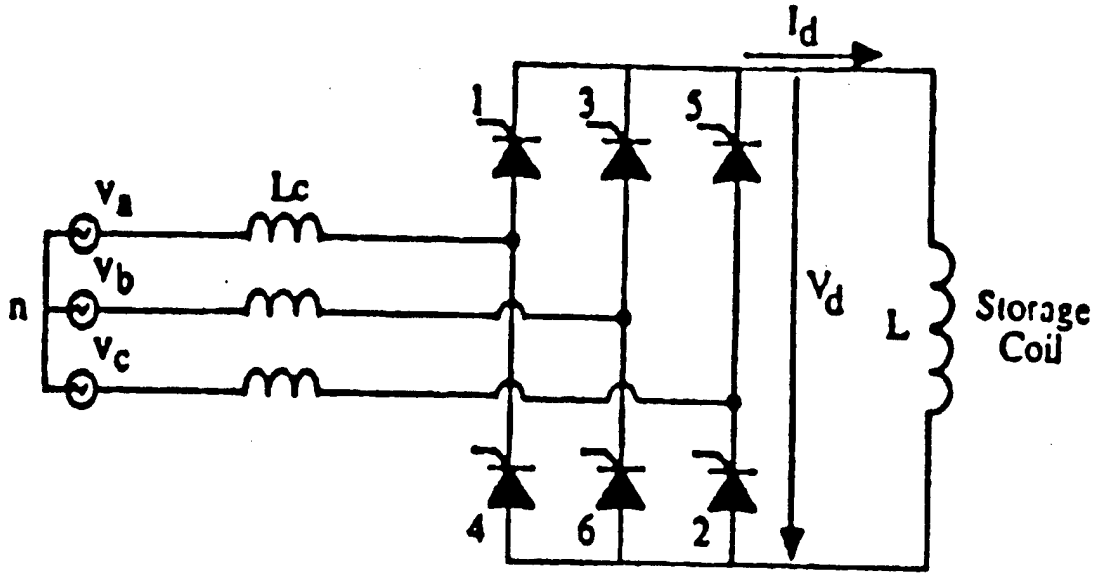

Figure 2-4. Electrical Circuit for a SMES Unit